THE INVENTION CLAIMED IS

1. A Dynamic InSAR imaging method, comprising:

sampling one or more fast-moving surface displacement waves from a plurality of moving platform positions utilizing a plurality of pulses from an electromagnetic radiation source and at least one antenna; and

reconstructing a plurality of phase differentials from said plurality of platform positions to produce a series of interferometric images of said waves.

2. The method of claim 1, wherein said fast-moving surface displacement waves comprise waves having a traveling velocity greater than about 100 m/sec.

3. The method of claim 1, wherein said fast-moving surface displacement waves comprise waves having a traveling velocity between about 300 m/sec and about 8000 m/sec.

4. The method of claim 1, wherein said sampling further comprises sampling the ¼ crests and the ¼ troughs of said waves.

5. The method of claim 1, wherein said waves have an amplitude of at least about 1 cm.

6. The method of claim 1, wherein said electromagnetic radiation source produces microwaves having a wavelength between about 1 mm and about 1 m.

7. The method of claim 5, wherein said source produces X-band microwaves.

8. The method of claim 1, wherein said moving platform comprises an airborne platform.

9. The method of claim 8, wherein said airborne platform comprises a jet aircraft.

10. The method of claim 1, wherein said moving platform comprises a satellite.

11. The method of claim 1, further comprising a dual-phase-center antenna.

12. The method of claim 1, further comprising a pair of physically separate antennas.

13. The method of claim 1, wherein said method includes along-track InSAR.

14. The method of claim 1, wherein said method includes repeat-pass InSAR.

15. The method of claim 1, where said method includes strip-mode InSAR.

16. The method of claim1, wherein said method includes spotlight InSAR.

17. A Dynamic InSAR imaging method, comprising:

sampling one or more fast-moving surface displacement waves from a plurality of moving platform positions utilizing a plurality of pulses from an electromagnetic radiation source and at least one antenna,

producing an offset phase center having a time lag t_{lag},

subtracting a phase difference having said time lag t_{lag} to produce a phase differential at each of said platform positions; and

reconstructing a plurality of said phase differentials to produce a series of interferometric images of said fast-moving surface displacement waves.

18. The method of claim 17, wherein said fast-moving surface displacement waves comprise waves having a traveling velocity greater than about 100 m/sec.

19. The method of claim 17, wherein said fast-moving surface displacement waves comprise waves having a traveling velocity between about 300 m/sec and about 8000 m/sec.

20. The method of claim 17, wherein said sampling further comprises sampling the ¼ crests and the ¼ troughs of said waves.

21. The method of claim 17, wherein said waves have an amplitude of at least about 1 cm.

22. The method of claim 17, wherein said time lag t_{lag} comprises the time it takes for a trailing (aft) phase center to travel to a position of a leading (forward) phase center, with $t_{lag} = B/V_{plat}$, where B is the distance between said aft and said forward phase centers and V_{plat} is said platform velocity.

23. The method of claim 17, wherein said electromagnetic radiation source produces microwaves having wavelengths between about 1 mm and about 1 m.

24. The method of claim 23, wherein said source produces X-band microwaves.

25. The method of claim 17, wherein said moving platform comprises an airborne platform.

26. The method of claim 25, wherein said airborne platform comprises a jet aircraft.

27. The method of claim 17, wherein said moving platform comprises a satellite.

28. The method of claim 17, further comprising:

shifting a receive array by at least one column between a pair of receive channels to produce said offset phase center.

29. The method of claim 17, further comprising:

turning on and off predetermined one or more outer conductor strips to produce said offset phase center.

30. A Dynamic InSAR imaging method, comprising:

sampling one or more fast-moving surface displacement waves from a plurality of moving platform positions utilizing a plurality of pulses from an electromagnetic radiation source and at least one antenna,

producing an offset phase center having a time lag t_{lag},

subtracting a phase difference having said time lag t_{lag} to produce a phase differential at each of said platform positions,

reconstructing a plurality of said phase differentials to produce a series of interferometric images having one or more sets of concentric rings associated with said fast-moving surface displacement waves.

31. The method of claim 30, wherein said concentric rings includes one or more primary sets of concentric rings.

32. The method of claim 30, wherein said concentric rings includes one or more primary concentric rings and one or more secondary sets of concentric rings.

33. The method of claim 30, wherein said concentric rings includes one or more displaced sets of concentric rings.

34. The method of claim 30, wherein said concentric rings include wave shadows.

35. The method of claim 30, wherein said concentric rings include diffuse reflections.

36. The method of claim 30, wherein said fast-moving surface displacement waves comprise waves having a traveling velocity greater than about 100 m/sec.

37. The method of claim 30, wherein said fast-moving surface displacement waves comprise waves having a traveling velocity between about 300 m/sec and about 8000 m/sec.

38. The method of claim 30, wherein said sampling further comprises sampling the ¼ crests and the ¼ troughs of said waves.

39. The method of claim 30, wherein said waves have an amplitude of at least about 1 cm.

40. The method of claim 30, wherein said time lag t_{lag} comprises the time it takes for a trailing (aft) phase center to travel to a position of a leading (forward) phase center, with $t_{lag} = B/V_{plat}$, where B is the distance between said aft and said forward phase centers and V_{plat} is said platform velocity.

41. A dual-phase-center InSAR apparatus, comprising:

a receive array capable of collecting a reflected radiation from an electromagnetic source,

a first channel receiver adapted to measure said reflected radiation collected from said array,

a second channel receiver additionally adapted to measure said reflected radiation collected from said array, said first and said second channel receivers being further adapted to produce a predetermined phase center offset (B), with B being a predetermined baseline distance between an aft and a forward phase center; and

wherein a phase difference between said phase center offset (B) corresponds to a wave velocity of one or more fast-moving surface displacement waves.

42. The apparatus of claim 41, wherein said phase center offset includes shifting said receive array by a column between said first and said second channel receivers to produce said baseline B, with $B = (\theta\lambda / 2\pi)(V_{plat} / U_{seis})$.

43. The apparatus of claim 41, wherein said phase center offset includes turning on and off one or more conductor strips arranged on said receive array to produce said baseline B, with $B = (\theta\lambda / 2\pi)(V_{plat} / U_{seis})$.